U.S. National Stage Application of PCT/EP03/02955

Attorney Docket No.: 53262-20088.00

Respectfully submitted MORRISON & FOERSTER LLP,

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Attached: Clean copy of pending claims

James Repar

Registration No. 36,902

Morrison & Foerster LLP 1650 Tyson's Boulevard

Suite 300

McLean, Virginia 22102 Telephone: (703) 760-7700 Facsimile: (703) 760-7777

Customer No. 25227

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Clean Copy of Pending Claims 1-20

- Claim 1. A method for production of plant storage lipids containing polyunsaturated fatty acids comprising providing an enzyme mixture containing at least one enzyme with phospholipid:diacylglycerol acyltransferase activity.
- Claim 2. The method of claim 1, wherein the enzyme mixture further contains at least one further activity of a hydroxylase, epoxygenase, acetylenase, desaturase, elongase, conjugase, trans-desaturase, isomerase or combination thereof.
- Claim 3. The method of claim 1, wherein the enzyme mixture further contains desaturase activity and elongase activity.
- Claim 4. The method of claim 1, wherein the polyunsaturated fatty acids comprise long-chain polyunsaturated fatty acids.
- Claim 5. The method of claim 1, wherein the polyunsaturated fatty acids comprise one or more of gamma-linolenic acid, arachidonic acid, gamma-limolenic acid, eicosapentaenoic acid, stearidonic acid or docosahexaenoic acid.
- Claim 6. The method of claim 1, wherein the at least one enzyme is encoded by a nucleotide sequence which is capable of replication, is present in a plant cell in at least 2 copies or contains regulatory sequences that bring about an at least 2-fold increase in gene expression or enzyme activity.
- Claim 7. The method of claim 6, wherein the nucleotide sequence is encoded chromosomally or extrachromosomally.

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- Claim 8. The method of claim 6, wherein the nucleotide sequence is derived from plants.
- Claim 9. The method of claim 6, wherein the nucleotide sequence is derived from *Arabidopsis thaliana*.
- Claim 10. The method of claim 1, wherein the at least one enzyme comprises the amino acid sequence of SEQ ID No.2.
- Claim 11. The method of claim 1, wherein the at least one enzyme or a part thereof is encoded by the nucleotide sequence of SEQ ID No. 1 or alleles thereof.
- Claim 12. The method of claim 1, wherein the polyunsaturated fatty acids contain fatty acids with conjugated double bonds.
- Claim 13. The method of claim 1, wherein the polyunsaturated fatty acids comprise fatty acids with a chain length of at least 14 carbon atoms and having at least 3 double bonds.
- Claim 14. The method of claim 1, wherein the polyunsaturated fatty acids comprise fatty acids not naturally found in plants.
- Claim 15. A method for producing polyunsaturated acids from a plant comprising: increasing a phospholipid:diacylglycerol acyltransferase activity of said plant; and isolating the polyunsaturated fatty acids.
- Claim 16. The method of claim 15, wherein increasing comprises increasing the copy number of a gene that encodes a phospholipid:diacylglycerol acyltransferase enzyme.

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Claim 17. The method of claim 15, wherein increasing comprises increasing the catalytic or regulatory activity of one or more enzymes involved in synthesis of fatty acids.

Claim 18. The method of claim 15, wherein increasing comprising transforming said plant with a nucleotide sequence.

Claim 19. The method of claim 18, wherein the nucleotide sequence comprises SEQ ID No. 1 or a homolog or allele thereof.

Claim 20. The method of claim 19, wherein the homolog has a sequence which is at least 60% identical to said nucleotide sequence.